

IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (currently amended): A multilayer printed wiring board manufacturing apparatus, ~~to be used for processing a multilayer printed wiring board having an interlayer resin insulator, comprising:~~

~~a processing laser source[[,] configured to emit a laser beam;~~

~~a scanning head for deflecting configured to deflect [[a]] the laser beam in X-Y directions[,,];~~

~~an X-Y table configured to hold a multilayer printed wiring board placed thereon, the multilayer printed wiring board having an interlayer resin insulator and at least one positioning mark;~~

~~a camera for reading configured to measure a position of the at least one positioning mark covered by the interlayer resin insulator by detecting light reflected by the at least one positioning mark positioning marks covered with the interlayer resin insulator of the multilayer printed wiring board,; and~~

~~an X-Y table for placing the multilayer printed wiring board,~~

~~a control apparatus having an input section for inputting to which processing data of the multilayer printed wiring board is input, an arithmetic operating section configured to correct the processing data based on the position of the at least one positioning mark and generate drive data for controlling at least one of the X-Y table and the scanning head to apply the laser beam to the multilayer printed wiring board and form a hole in the interlayer resin insulator, and a memory section for storing configured to store the processing data and the drive data or an arithmetic operations result and an arithmetic operating section, wherein the processing data is input from the input section and this processing data is stored in the memory section;~~

~~a position of a positioning mark of the multilayer printed wiring board placed on the X-Y table is measured with the camera;~~

~~the input processing data is corrected on the basis of the measured position of the positioning mark to generate X-Y table drive data in the arithmetic section and this drive data is then stored in the memory section; and~~

~~the drive data is read from the memory section and then the X-Y table and the scanning head are controlled in a control section and thereby the laser beam is radiated to the multilayer printed wiring board to eliminate the interlayer resin layer to form a hole for a via hole.~~

Claim 2 (currently amended): The multilayer printed wiring board manufacturing apparatus according to claim 1, wherein said at least one positioning mark is formed of comprises a metal conductor.

Claim 3 (currently amended): The multilayer printed wiring board manufacturing apparatus according to claim 1, wherein said at least one positioning mark is formed simultaneously with comprises a material same as a conductive circuit.

Claim 4 (currently amended): A multilayer printed wiring board manufacturing method comprising the steps of:

forming [[a]] at least one positioning mark covered with an interlayer insulating agent layer and an interlayer insulating agent layer on a multilayer printed wiring board;

forming at least one interlayer insulating agent layer covering the at least one positioning mark;

providing a multilayer printed wiring board manufacturing apparatus including a processing laser source configured to emit a laser beam, a scanning head configured to deflect the laser beam in X-Y directions, a camera configured to measure a position of the at least one positioning mark, an X-Y table configured to hold the multilayer printed wiring

board, and a control apparatus having an input section to which processing data of the multilayer printed wiring board is input, and an arithmetic operating section configured to correct the processing data based on the position of the at least one positioning mark;

placing [[a]] the multilayer printed wiring board having formed said at least one positioning mark on [[an]] the X-Y table of [[a]] the multilayer printed wiring board
manufacturing apparatus comprising a processing laser source, a scanning head for deflecting a direction of a laser beam in X-Y directions, a camera for reading the positioning mark of the multilayer printed wiring board, an X-Y table for placing the multilayer printed wiring board, an input section for inputting processing data of the multilayer printed wiring board, a memory section for storing the processing data or an arithmetic operations result and an arithmetic operating section, and inputting processing data to this manufacturing apparatus;

measuring [[a]] the position of the at least one positioning mark of the multilayer printed wiring board with the camera[[],] by detecting light reflected by the at least one positioning mark;

correcting the input processing data based on the measured position of the at least one positioning mark position to generate scanning head and X-Y table;

generating drive data for driving at least one of the scanning head and the X-Y table
in the arithmetic operating section and then;

storing this drive data in the memory section; and
reading the drive data from the memory section to control controlling at least one of
the X-Y table and the scanning head in a control section based on the drive data; and
radiating applying the laser beam to the multilayer printed wiring board to eliminate
the interlayer resin layer to form a hole for a via hole in the at least one interlayer insulating
agent layer.

Claim 5 (currently amended): A multilayer printed wiring board manufacturing apparatus comprising:

a CO₂ laser source[[,]] configured to emit a laser beam;

a scanning head ~~for deflecting a direction of a~~ configured to deflect the laser beam in X-Y directions; [[or]]

an X-Y table ~~for displacing a position of~~ configured to move a multilayer printed wiring board disposed thereon; and, wherein

harmonic wave generating means for converting the laser beam oscillated emitted from said CO₂ laser source ~~is converted~~ to a beam of ~~shortened wavelength~~ by harmonic wave generating means, a second harmonic wave,

wherein a diffraction of the laser beam at least one of the scanning head and the X-Y table is controlled, ~~and to apply~~ the laser beam ~~forms~~ to the multilayer printed wiring board to form a via hole in the multilayer printed wiring board.

Claim 6 (canceled)

Claim 7 (currently amended): A multilayer printed wiring board manufacturing apparatus[[,]] comprising:

a CO₂ laser source[[,]] configured to emit a laser beam;

harmonic wave generating means for converting the laser beam to a shortened wavelength laser beam of a second harmonic wave;

a scanning head ~~for deflecting~~ configured to deflect the shortened wavelength laser beam in [[the]] X-Y directions[[,]];

an X-Y table configured to hold a multilayer printed wiring board placed thereon, the multilayer printed wiring board having at least one positioning mark;

a camera for reading configured to measure a position of the at least one positioning marks mark of [[a]] the multilayer printed wiring board[[,]]; and

~~an X-Y table for placing a multilayer printed wiring board,~~

~~a control apparatus having an input section for inputting the to which processing data of the multilayer printed wiring board is input, an arithmetic operating section configured to generate drive data for driving at least one of the scanning head and the X-Y table based on the position of the at least one positioning mark and the processing data and controlling at least one of the scanning head and the X-Y table to apply the shortened wavelength laser beam to the multilayer printed wiring board to form a hole in the multilayer printed wiring board, and a memory section for storing configured to store the processing data and the drive data or the arithmetic operations result, and an arithmetic operating section, wherein the processing data is input from the input section and this processing data is stored in the memory section;~~

~~position of the target mark of the multilayer printed wiring board placed on the X-Y table is measured with the camera;~~

~~the data for driving the scanning head and the X-Y table is generated from the measured position and the input processing data in the arithmetic operating section, and the drive data is stored in the memory section; and~~

~~the drive data is read from the memory section and then the X-Y table and the scanning head are controlled in the control section and thereby the laser beam is radiated to the multilayer printed wiring board to eliminate the interlayer resin layer to form the hole,~~

~~the laser beam oscillated from said CO₂ laser source being converted to the shortened wavelength laser beam of second harmonic wave by harmonic wave generating means.~~

Claim 8 (currently amended): The multilayer printed wiring board manufacturing apparatus according to claim 5 or claim 7, wherein said harmonic wave generating means [[is]] comprises [[a]] at least one non-linear optical crystal which reflects the processing laser beam emitted from the CO₂ laser source to [[the]] a harmonic wave emitting side and gives

~~thereto the function to transmitting harmonic wave transmits the shortened wavelength laser beam.~~

Claim 9 (currently amended): The multilayer printed wiring board manufacturing apparatus according to claim 8, wherein said ~~at least one~~ non-linear optical crystal ~~is formed of comprises~~ a material selected from ~~the group consisting of~~ tellurium, gallium-selenium, antimony sulfide, arsenic sulfide, mercury sulfide and selenium.

Claim 10 (currently amended): A multilayer printed wiring board manufacturing method comprising:

~~utilizing providing a manufacturing apparatus comprising a CO₂ laser source configured to emit a laser beam, a harmonic wave generating apparatus for converting configured to convert the laser beam emitted from said CO₂ laser source to [[the]] a shortened wavelength beam of the second harmonic wave, a scanning head for deflecting the direction of configured to deflect the laser shortened wavelength beam in [[the]] X-Y directions, an X-Y table configured to hold a multilayer printed wiring board having at least one target mark and an interlayer resin insulator, and a camera for reading configured to measure a position of the at least one target mark of the multilayer printed wiring board and an X-Y table for placing the multilayer printed wiring board, comprising the steps of:~~

~~measuring[[,]] with [[a]] the camera[[,]] the position of the at least one target mark position of the multilayer printed wiring board having the interlayer resin insulator placed on the X-Y table;~~

~~generating drive data for driving at least one of the scanning head and the X-Y table drive data from based on the measured position of the at least one target mark and the processing data; [[and]]~~

~~controlling at least one of the X-Y table and the scanning head based on the drive data; and~~

~~radiating applying~~ the shortened wavelength beam of the second harmonic wave obtained ~~transmitted~~ from the harmonic wave generating apparatus to the multilayer printed wiring board to ~~eliminate the interlayer resin layer~~ to form a hole in the ~~interlayer resin insulator~~.

Claim 11 (currently amended): A laser processing apparatus comprising:
a CO₂ laser source[[,]] ~~configured to emit a laser beam;~~
~~harmonic wave generating means for converting the laser beam to a shortened wavelength beam of a second harmonic wave;~~
~~a scanning head for deflecting a direction of a laser~~ ~~configured to deflect the shortened wavelength beam [[to]] in X-Y directions; and [[or]]~~
~~an X-Y table for displacing a position of~~ ~~configured to move~~ a work piece to be processed,
wherein ~~the laser beam oscillated from said CO₂ laser source is converted to a shortened wavelength beam by harmonic wave generating means, a diffraction of the laser beam at least one of the scanning head and the X-Y table is controlled, and the laser to apply the shortened wavelength beam forms to the work piece to form~~ a via hole in the work piece.

Claim 12-25 (canceled)

Claim 26 (currently amended): The multilayer printed wiring board manufacturing apparatus according to Claim 5, wherein said via hole is formed by ~~feuussed focusing spot diameter the beam.~~

Claim 27 (currently amended): The multilayer printed wiring board manufacturing apparatus according to Claim 11, wherein said via hole is formed by ~~feuussed focusing spot diameter the shortened wavelength beam.~~

Claim 28 (new): The multilayer printed wiring board manufacturing method according to Claim 4, wherein the at least one interlayer insulating agent layer has light transmissivity.

Claim 29 (new): The multilayer printed wiring board manufacturing method according to Claim 4, wherein the light source comprises a light emitting diode.

Claim 30 (new): The multilayer printed wiring board manufacturing method according to Claim 4, wherein the at least one positioning mark has a rough surface.

Claim 31 (new): The multilayer printed wiring board manufacturing method according to Claim 4, wherein the processing data comprises hole coordinate data, and the hole coordinate data is corrected in view of a size change of the multilayer printed wiring board to produce a modified hole coordinate data.

Claim 32 (new): The multilayer printed wiring board manufacturing method according to Claim 4, wherein the scanning head is controlled based on the drive data.

Claim 33 (new): The multilayer printed wiring board manufacturing method according to Claim 4, further comprising generating a laser data based on the position of the at least positioning mark, the laser data indicating timing of a laser oscillation of the processing laser source.

Claim 34 (new): The multilayer printed wiring board manufacturing method according to Claim 4, wherein the at least one interlayer insulating agent layer comprises a plurality of interlayer insulating agent layers including an upper layer and an lower layer, the at least one positioning mark comprises a plurality of positioning marks including a positioning mark provided in the upper layer and a positioning mark provided in the lower layer, and the positioning mark of the upper layer is deviated from the positioning mark of the lower layer.